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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/576,258

04/18/2006

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EXAMINER

TIETJEN, MARINA ANNETTE

ART UNIT

PAPER NUMBER

3753

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/576,258	<b>Applicant(s)</b> MASAMURA ET AL.	
	<b>Examiner</b> MARINA TIETJEN	<b>Art Unit</b> 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/03/2009 has been entered.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection. The instant Office Action has been made Non-Final.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-8 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Browne et al. (U.S. Pat. No. 6,394,417).

Browne et al. disclose a diaphragm valve (300, figs. 14) comprising:

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a body (F) having an upper opening (in which valve element E is situated);

a first flow passage (312) and a second flow passage (320) formed in the body (F) to open into the upper opening;

a diaphragm valve element (E) covering the upper opening to form an airtight space through which the first (312) and second (320) flow passages are allowed to communicate with each other;

a valve seat (324, fig. 13) formed in the body (F);

an urging member (shown as spring in figs. 11-12) urging the diaphragm valve element (E) against the valve seat (324) into a valve-closed state (fig. 14); and

an actuator (B, air actuated, col. 9, line 32) adapted to bring the diaphragm valve element (E) out of contact with the valve seat (324) into a valve-opened state (similar to fig. 11);

wherein the diaphragm valve element (E) comprises:

a main body (G) which is to be brought into/out of contact with the valve seat (324);

a diaphragm part (similar to J in fig. 12) formed extending in a curve, radially from the main body (G), and including a root (see labeled fig. 14 below) connected to the main body (G), a radially outer portion of the root (labeled fig. 14) being positioned inside the diameter of the valve seat (324) so that liquid pressure acts on a region (318) outside the root (labeled fig. 14) connected to an upper surface of the main body (G) for reducing an urging force of the urging

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member (such as spring, fig. 12), the diaphragm valve (300) being capable of reducing an occurrence of water hammer ; and

a fixed part (306, fig. 11) formed at an outer peripheral edge of the diaphragm part (J) and held at a position higher than the root (labeled fig. 14) during the valve-closed state (fig. 14);

wherein the diaphragm valve element (E) in which the diaphragm part (J) having a thin wall and the fixed part (306) having a thick wall are formed so that respective upper surfaces are flush with each other, and the fixed part (306) is held between a lower fixing face (of housing D) and an upper fixing face (of body F) which extends to the diaphragm part (J);

further comprising a guide face (see labeled fig. 14 above) having a slope contiguous from the upper fixing face above the diaphragm part (J) so that the diaphragm part (J) comes into contact with the guide face (labeled fig. 14) when the diaphragm valve element (E) is separated from the valve seat (324);

wherein a fluid-pressure-receiving area (bottom surface G) of the main body is as large as or larger than a fluid-pressure-applied area of the diaphragm part (bottom surface area of J);

wherein the root (labeled fig. 14) substantially vertically extends upward from the main body (G);

wherein an upper surface (which includes region 318) of the main body (G) inclines downward in a direction away from the urging member (such as spring in fig. 11); and

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wherein the fixed part (306) formed at an outer peripheral edge of the diaphragm part (J) is held at the position higher than the root (labeled fig. 14) during the valve-closed state (fig. 14) and the valve-opened state (similar to fig. 11).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-7 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cooksley (U.S. Pat. No. 3,407,845) in view of Saarem et al. (U.S. Pat. No. 4,180,236) further in view of Browne et al. (U.S. Pat. No. 6,394,417).

Cooksley discloses a diaphragm valve (10, figs. 1, 5) comprising:

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a body (11) having an upper opening (in which diaphragm valve element 18 is situated);

a first flow passage (12) and a second flow passage (13) formed in the body (11) to open into the upper opening;

a diaphragm valve element (18, 20, 21) covering the upper opening to form an airtight space through which the first (12) and second (13) flow passages are allowed to communicate with each other;

a valve seat (17) formed in the body (11);

an urging member (33) urging the diaphragm valve element (18, 20, 21) away from the valve seat (11) into a valve-open state; and

an actuator (28) adapted to bring the diaphragm valve element (18, 20, 21) into contact with the valve seat (17) into a valve-closed state;

wherein the diaphragm valve element (17) comprises:

a main body (18, 20) which is to be brought into/out of contact with the valve seat (17);

a diaphragm part (21) formed extending in a curve (21a/b), radially from the main body (18, 20), and including a root (where 21b meets 20) connected to the main body (18, 20), a radially outer portion of the root being positioned inside the diameter of the valve seat (17) (radially outer portion of root clearly shown inside the diameter of the valve seat in fig. 5) so that liquid pressure acts on a region outside the root connected to an upper surface of the main body (20, 18) for reducing an urging force of the urging member (col. 7, lines 25-44), the

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diaphragm valve (10) being capable of reducing an occurrence of water hammer;  
and

a fixed part (part clamped between 14 and 11) formed at an outer  
peripheral edge of the diaphragm part (21a/b);

further comprising a guide face (14a) having a slope contiguous from the upper  
fixing face above the diaphragm part (21a/b) so that the diaphragm part comes into  
contact with the guide face (14a) when the diaphragm valve element (18, 20, 21) is  
separated from the valve seat (17);

wherein a fluid-pressure-receiving area (19) of the main body (18, 20) is as large  
as or larger than a fluid-pressure-applied area of the diaphragm part (21a);

wherein the root (where 21a meets 20) substantially vertically extends upward  
from the main body (18, 20);

further comprising a circular groove formed around the valve seat (shown in fig. 1  
outside seat 17);

wherein the first flow passage (12) is in communication with the circular groove  
formed around the valve seat (17); and

wherein the diaphragm valve element (18, 20, 21) has a thin wall (21a) and the  
fixed part has a thick wall (part clamped between 14 and 11), and the fixed part is held  
between a lower fixing face (of body 11) and an upper fixing face (of housing 14) which  
extends to the diaphragm part (21a).

However, Cooksley does not disclose the urging member urges the diaphragm  
valve element against the valve seat and that the actuator is adapted to bring the valve



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element out of contact with the valve seat; wherein the fixed part is held at a position higher than the root during the valve-closed state and the valve-open state; and wherein the diaphragm part thin wall and fixed part thick wall are formed so that respective upper surfaces are flush with each other.

Saarem et al. teach normally-open and normally-closed diaphragm valves, wherein the actuator (solenoid; col. 1, lines 7-14) is used to move the valve from its original position to the opposite position, are typical and well known in the art.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Cooksley's normally-open valve to one that is normally-closed, in a manner known in the art, which yields predictable results.

However, Saarem does not teach the fixed part held at a position higher than the root during the valve-closed state and the valve-open state; and wherein the thin wall of the diaphragm part and the thick wall of the fixed part are formed so that respective upper surfaces are flush with each other.

Browne et al. teach a fixed part (306) held at a position higher than a root during the valve-closed state and the valve-open state, and wherein a thin wall of a diaphragm and a thick wall of a fixed part (306) are formed so that respective upper surfaces are flush with each other for the purpose of providing a sealing arrangement between the upper housing (D) and lower body (F) that eliminates sharp edges and thereby significantly improves the cleanability of the valve, and wherein the flush surface creates a complementary surface on the diaphragm for interfacing with the surface of the upper housing (D). Furthermore, it would have been obvious to one having ordinary skill in the

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art at the time the invention was made to adjust the position of the root to the fixed part, since it has been held that the provision of adjustability, where needed, involves only routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA 1954).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Cooksley's valve such that the fixed part held at a position higher than the root during the valve-closed state and the valve-open state; and wherein the thin wall of the diaphragm part and the thick wall of the fixed part are formed so that respective upper surfaces are flush with each other, as taught by Browne et al., for the purpose of providing a sealing arrangement between the upper housing and lower body that eliminates sharp edges and thereby significantly improves the cleanability of the valve, and wherein the flush surface creates a complementary surface on the diaphragm for interfacing with the surface of the upper housing.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Pat. Nos. 6,056,003 (Madsen et al), 5,217,043 (Novakovi), 6,000,416 (Kingsford et al.), 2,752,936 (Cantalupo), 1,939,911 (McCune), and 2,623,542 (Obermaier) teach it is a common configuration in a diaphragm valve wherein the fixed end is held higher than the root of the diaphragm member at the open and closed positions. Kingsford et al., Cantalupo, and Obermaier further teach it is a common configuration for the thin wall of the diaphragm member and the thick wall of the fixed part to have flush upper surfaces. Obermaier further teaches a normally-closed solenoid actuated diaphragm valve as is conventionally known. U.S. Pat. No.

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4,903,939 (Ariizumi et al.) teaches normally-open and normally-closed pneumatically actuated diaphragm valves are conventionally known in the art. U.S. Pat. No.

4,872,638 (Thompson et al.) discloses a diaphragm valve with a root connected to a main body, wherein the root is positioned inside the diameter of the valve seat, and further comprising a region of the upper surface of the main body inclining away from an urging member, wherein the region is positioned radially outward of the root and within the diameter of the valve seat.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARINA TIETJEN whose telephone number is (571) 270-5422. The examiner can normally be reached on Mon-Thurs, 9:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ROBIN EVANS can be reached on (571) 272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. T./  
Examiner, Art Unit 3753

/John K. Fristoe Jr./  
Primary Examiner, Art Unit 3753